STRATEGY RESEARCH PROJECT

NETWORK CENTRIC LOGISTICS

BY

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ABSTRACT

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Focused Logistics is one of four key tenets of both JV2010 and JV2020. With information superiority as its basis, JV 2010 and JV2020 provide a framework to leverage technological advances. Optimum information architectures, which allow information to flow effectively between Joint and coalition air-, land- and sea-based forces, must be fielded to enable precision war fighting and ensure victory with minimal assets and lowest possible losses.

Focused Logistics will be the fusion of information, logistics and transportation technologies to provide rapid crisis response, to track and shift assets even while en route, and to deliver tailored logistics packages and sustainment directly at the strategic, tactical and operational level of operations.

Net-centric Warfare has evolved based on a co-evolution of economics, information technology, and business processes and organizations. These processes are linked by the shift in focus from the platform to the network, the shift from viewing actors as independent to viewing them as part of a continuously adapting ecosystem, and the importance of making strategic choices to adapt or even survive in such changing ecosystems.

This paper will use net-centric warfare concepts to recommend changes in order to present an integrated concept toward achieving the Focused Logistics tenet of JV2020.

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NETWORK CENTRIC LOGISTICS

"The only thing harder than getting a new idea into the military is getting an old one out,"

- B. H. Liddell Hart

Logistics support plays a vital role in delivering combat power in any military operation. With the designation of the Focused Logistics tenet in Joint Vision 2010 and 2020, our most senior leaders have recognized the importance logistics has on the success of any military operation. Joint Publication 4-0, Doctrine for Logistics Support of Joint Operations, was recently revised in April 2000. General Henry H. Shelton, Chairman of the Joint Chiefs of Staff, commented on the introduction of the term 'Focused Logistics' to JP 4-0. He said, "This is in recognition of the fact that transformation in how we conduct logistics is underway. The route of sustainment --- from point of supply to user --- is the lifeblood of combat power".

Network Centric Warfare emerged from many sources, but its growth is in response to the amazing growth of information networks over the last decade. The Navy's first prototype in this area can be most closely attributed to a concept called 'Ring of Fire' in 1994, which was an attempt to link the sensors of numerous weapons platforms, and in support of the Marine Corps Operational Maneuver from the Sea doctrine. The last Chief of Naval Operations, Admiral Jerry Johnson, as a shift from platform-centric operations, has described it.

This paper shall integrate some of the concepts in Network-centric warfare toward achieving the Focused Logistics tenet of JV2020.

THE INFORMATION AGE

Information has always been at the core of military operations. But today's networked, information environment is driving us to develop quicker and more collaborative communication capabilities. New concepts, which make sense of this environment, will allow us to make quicker and more decisive decisions. The two key concepts, which are the basis of this paper, are network centric warfare and the Joint Vision 2020 Focused Logistics tenet.

The term, Net centric warfare, is one that easily evokes an image of technology in an attempt to control of the fog of war. In the book, Network Centric Warfare, the authors address this first by *disclaiming* that it will make change to the nature of warfare, makes us more vulnerable to asymmetric attacks, or that it is an attempt to 'automate' war. The authors then go on to explain aspects of the Information Age. One of the primary points made is that Information is a force multiplier.

A major premise of network centric warfare is that accurate and timely information will result in more accurate weapons on target, thus reducing the requirement for more weapons. The ability to use information warfare to exploit an enemy's decision process, or to raise the enemy's uncertainty, is another force multiplier.

The underlying foundational premise for Network Centric Warfare is Metcalfe's' Law, which states that as the number of nodes in a network increases linearly, the potential "value or "effectiveness" of the network increases exponentially as the square number of nodes in the network. Thus, by fusing the various networks together we can, for example, get a more accurate target picture and improved missile guidance.

Metcalfe's Law can also be applied to logistics. In JV2020, Focused Logistics will be the fusion of information, logistics and transportation technologies to provide rapid crisis response to track and shift assets while en route, and to deliver tailored logistics packages and sustainment directly at the strategic, tactical and operational level of operations.

The ability to the have our logistics system respond rapidly depends on the ability of people in the logistics system to support emerging concepts, and take advantage of new technology. It is useful, therefore, to examine the history of DOD logistics automation in relation to supporting military operations.

LESSONS OF HISTORY

The first extensive effort to automate our logistics system occurred in the 1960s. At that time, the system was a truly advanced system. Since it was developed, each of the Services have subsequently built layer upon layer of business rules and functionality to this system. Although there has been a modicum of successes to modernize the DOD logistics infrastructure in the past, these efforts have had marginal improvements. It is useful to start in the 60's to see where we have come from, in relation to where we are going in an effort bring network centric capabilities to our logistics system.

FROM VIETNAM TO DESERT STORM

New logistics planning factors were created during the Vietnam conflict at the behest of Commander, Military Assistance Command Vietnam. Due to the coarseness of available data, the planning factors were derived by dividing the tons of "stuff" shipped into theater by the theater troop strength; thus, all the new planning factors were in units of pounds per man per day. Rations and M-16 rounds are perhaps sensibly quoted in these terms, but other commodities are not: specifying naval ship propulsion fuel usage in pounds per man per day is not terribly useful. Navy logistics planners began the Gulf War in 1990 fully expecting to supply

each aircraft carrier with 188 tons of ammunition per day, based on Vietnam logistics planning factors. In Vietnam, carrier aircraft had dropped a great many "dumb" bombs. In early 1991, when the air campaign began in the Gulf, precision guided munitions partially substituted for the brute force of tons of dumb bombs, and actual carrier ammunition usage resulted in less than half the planning factor.

While precision guided munitions and other high-technology projects were being initiated in the 1970s, logistics was largely ignored. Non–high tech improvements to strategic sealift were bought in the early 1980s in the form of the fast sealift ships, crane ships, two hospital ships and initiation of the maritime pre-positioning program. With the exception of these programs, logistics did not favorably share in the technology of the 1980s. Most importantly, it was not accounted for in command and control systems. Software support programs for operational and tactical logistics were not developed, nor did critical logistics operations functions claim any part of the available communications bandwidth. The logistics software support programs that were written pertained to inventory and maintenance accounting, which was administrative in nature rather than operational or tactical.[1]

OPERATIONS DESERT SHIELD AND STORM

Operations Desert Shield and Desert Storm was the most recent large-scale operation, which tested the logistics supply pipeline of each Service into a single theater. It clearly demonstrated the need to revise our existing theater-level logistics doctrine and infrastructure. Lieutenant General William G. Pagonis commented that during the early phases of Desert Shield, "Logisticians had to compete for space on incoming planes to get experts in theater and create a structure for a deployment that was already well underway."

Each of the Service combatant commanders procured enough antitank ammunition or bombs to destroy the entire Iraqi tank forces with their own combat forces alone. Assessments conducted after the conflict indicated that there was entirely too much ammunition delivered to the theater. The waste of limited transportation resources and funds, caused by this oversupply of ammunition, would have been further exacerbated in an economy-of-force scenario. Some would argue that this waste delayed the initiation of the Gulf War offensive. In either case, we can't afford this type of waste in the future. The lessons from the Gulf War dictate modernizing our joint logistics doctrine, operations, and systems.

CORPORATE INFORMATION MANAGEMENT (CIM) INITIATIVE.

Flush from both a Cold War and Desert Storm victory, DOD engaged in a large downsizing initiative to gain a perceived 'peace dividend'. This resulted in many Defense

Management Review Decisions, which consolidated numerous administrative functions to Defense Agencies like the Defense Finance and Accounting Service, Defense Logistics Agency and Defense Information Systems Agency. One of the most ambitious efforts was the Corporate Information Management (CIM) Initiative. The CIM established the Joint Logistics Systems Center at Wright Patterson Air Force Base, and advertised that it would achieve $36 billion in savings by fiscal year 1997.[2] Today, however, DoD is neither projecting nor tracking CIM savings.

CIM was an effort to consolidate each of the Services' information systems into one system that each Service would use. The process to create these systems used an innovative and complementary approach of business process modeling and logical data modeling. The problem with CIM is that each Service had very few individuals who completely understood these systems. In addition, building on successive generations of the same basic architecture, the business rules and data models were contained in tens of millions of lines of code. The thousands of experienced programmers who created and maintained this code had subsequently retired or left the project and, in many cases, did not leave adequate documentation in order to determine or reconstruct how the code was built.

In addition, each Service went into the CIM initiative with an understanding that there could be no compromise to the functionality built into their current legacy system. The CIM initiative came at the beginning of the information revolution and widespread introduction of the Internet into American society. The CIM approach, based on an older model of systems development, came at a time when people were first beginning to see the power of information. Although CIM had a noble agenda, its rigid, centralized management structure did not lend itself toward the distributed information environment, which emerged in the early 1990s.

ELECTRONIC DATA INTERCHANGE

Electronic Data Interchange has been around as long as there have been information systems that run the DOD Logistics System. In the Department of Defense, the standards for these systems were established under the Defense Logistics Standard System (DLSS). Established in 1962, the DLSS have enabled DoD logistics managers and consumers to communicate electronically via fixed 80 record position (RP) transactions. The functional procedures and supporting transactions have been the backbone of DoD's logistics system, with approximately one billion transactions transmitted annually.[3] Used by over 70,000 customer activities, these standards have been implemented by the Military Services, Federal and DoD agencies, defense contractors, and allied governments. The hub of this system is the Defense

Automatic Addressing System Center (DAASC). In addition, the DLSS have been a source of management information for military operations, planners, and field commanders requiring intelligence information.

Over time, the fixed length DLSS transactions reached the saturation point and it has become virtually impossible, within the 400+ transaction types created to this point, to satisfy the rapid growing logistics requirements. Further, the inflexibility and complexity of DLSS transactions created a backlog of approved but unimplemented changes.

DOD recognized these problems and created the Modernization of Defense Logistics Standards System (MODELS) program in 1984. The charter is defined as not merely an update of assorted procedures, but a fundamental redesign of the way DLSS functions are performed. The MODELS program utilizes Electronics Data Interchange (EDI) logistics transactions, which conform to national EDI standards established by the American National Standards Institute (ANSI) Accredited Standards Committee. The main difference in these new transactions is that they support variable length transaction sets, to include new logistics initiatives such as total asset visibility, serial number tracking, and weapon system identification.[4] The MODELS project goals have been incorporated into the Defense Logistics Management System.

One problem with MODELS/DLMS, and the initiative to move to ANSI based transactions is that it proliferates batch oriented information processing. Another problem is that Network Centric Logistics demands a web-based capability that is real time, not batch and forward. Finally, although DAASC has the routing information to pass and forward MILS transactions, each of the services' functionally oriented legacy systems contain most of the business rules that drive that logistics process and bring parts to the war fighter.

CURRENT AND FUTURE SYSTEMS

There are thousands of systems that the DOD uses in support of logistics operations. Each has slightly different variations of common functionalities, and the Services are striving to consolidate their systems. However, we are no longer on the path of consolidating our logistics systems into one big system, as defined by CIM. Today's strategy toward logistics modernization is often called a 'system of systems' approach. This allows each of the services to modernize their logistics system, with the idea that these systems conform to a standard.

In order to make some sense of how they fit together, these systems shall be categorized into supporting systems or supported systems. In addition, there are common, chronic problems all logistics systems have experienced. A third category, Enabling Technology, will be used to address these problems.

ENABLING TECHNOLOGY

Enabling Technology is not a system in and of itself. These technologies are emerging as critical enablers in order to exploit today's information environment, especially in the area of logistics. I will describe three different enabling technologies. These include Automatic Identification Technology, Bandwidth, and Enterprise Resource Planning Systems.

Automatic Identification Technology (AIT)

AIT enables and facilitates data collection and transmission to automated information systems (AISs). AIT can improve DoD's logistics business processes and enhance war-fighting capability by facilitating the collection of initial source data, reducing processing times, and improving data accuracy. The use of AIT is a key component in DoD's efforts to provide timely visibility of all logistics assets, whether in process (being procured or repaired), in storage (being stored as inventory), or in transit (being shipped to another location).

AIT encompasses a variety of read and write data storage technologies that can be used to capture asset identification information. Those technologies include bar codes, magnetic stripes, integrated circuit cards, optical memory cards, and radio frequency (RF) identification tags. AIT devices offer a wide range of data storage capacities from a few characters to thousands of bytes. The information on each device can range, for example, from a single part number to a self-contained database. The devices can be interrogated using a variety of means, including contact, laser, or RF, with the information obtained from those interrogations provided electronically to AISs that support DoD's logistics operations.

DoD's informational needs cannot be satisfied by just one AIT device. Due to the diversity of DoD's operating environments, and the large number of commercial and military activities supporting its logistics requirements, the DoD needs a suite of devices. Significant devices in the suite include (but are not limited to) linear bar codes, two-dimensional (2D) bar codes, optical memory cards (OMCs), and radio frequency identification (RFID) tags.

One example of a recent application of AIT is the Navy's Smart Storeroom Project. In this project, a storeroom filled with approximately 750 high demand aviation depot level repairables, was marked with radio frequency tags. A radio frequency reader was placed at the entrance to the storeroom in order to record movement of each item, successfully recorded movement of each of the items in the storeroom. Although a complete business case analysis has not yet been made, the goal of this application is to reduce the number of sailors required to maintain perfect inventory accuracy of these high value items.

Bandwidth

Bandwidth (more accurately called Data Throughput) has been a chronic problem experienced by DOD operational logisticians from all Services. The first ever Focused Logistics War Game (FLOW) was conducted in October 1999. The purpose of the FLOW was to evaluate the Services ability to support the Focused Logistics tenet of JV2020. Of the over 100 issue papers delivered during this War Game, bandwidth was one of the top two issues that all the Services agreed that needed to be addressed.

Bandwidth allocation is a two dimensional issue. One dimension is to raise the priority of logistics information in the scale of all information over the DOD domain. The other is to increase the amount of bandwidth available to the war fighter. The move to web based systems can help solve this problem.

As we discussed earlier, the foundation for the DOD Logistics System is the MILS system, which created a standard 80 record position transaction for every supply transaction. These transactions have been batched into groups and forwarded to a central system (DAASC) for many years. Recent efforts have attempted to move from a batch and forward system to a web based system. In the aggregate, this will be a different sort of bandwidth requirement. A web-based system requires a continuous open channel for logistics bandwidth. By keeping this channel open, it will eliminate the need to batch and forward transactions, thus eliminating bandwidth surges, and providing better planning for the operators.[5]

Enterprise Resource Planning (ERP) Systems

Coined in the early to mid-1990s, the term "ERP" originally referred to a suite of integrated software applications that connected back-office operations such as manufacturing, financials, and human resources into one system. Today, however, ERP software consists of applications that link not only back-office operations, but also front-office operations and internal and external supply chains. As such, ERP software has evolved to a much broader scope of applicability in the organization, and has literally become the center of the organization's application architecture, or what some have referred to as the "enterprise backbone", linking its functional areas and its business processes.

The Navy has embarked on an ERP pilot to replace many legacy systems which support the Wholesale and Retail Supply System. The Army and the Defense Logistics Agency are pursuing similar initiatives. The essence of the project is based on an effort to replace legacy systems whose foundation was built in the 1960s. For the Navy, business rules have expanded so much in scope that now these systems comprise over 6 million lines of IBM COBOL Code.

Making changes to this system has proven onerous, at best. The most recent attempt to improve this system was the JLSC effort, as previously mentioned.

Realizing that Navy leadership involvement from the Navy Systems Commands is, the Navy has embarked on the ERP pilot with broad senior leader commitment and endorsement from all the Navy Systems Commands. The details of converting the 400 different MILS transactions into one that an ERP can understand will be the true test of this initiative. Other Services are working on similar ERP initiatives, and there have been some inter-service meetings to ensure that the ERP solutions are interoperable.

SUPPORTING SYSTEMS

Supporting systems may be considered key transaction based systems. These AISs provide feeder information to the operational logistician responsible for mission accomplishment.

Global Transportation Network (GTN)

GTN is an automated command and control (C2) system for mobility forces and the defense logistics infrastructure to enable USCINCTRANS to manage the Defense Transportation System for the Department of Defense. GTN is one of the key systems which will allow the theater commander to manage his assets.

Joint Total Asset Visibility

JTAV is the capability to provide users with timely and accurate information on the location, movement, status, and identity of units, personnel, equipment, and supplies. It facilitates the capability to act upon that information to improve overall performance of DoD's logistics practices.

Joint Operational Planning and Execution System (JOPES)

JOPES provides the overall framework for the Military Planning process, both the five-phase deliberate planning process (DPP) and the six-phase crisis action planning (CAP) process. The need for JOPES stemmed from the recognition, based on actual crisis situations, that previous systems focused primarily on deployment and did not adequately support employment activities. JOPES was therefore developed to give senior level decision makers the tools to monitor, analyze, and control events during both the planning and implementation of joint operations.

SUPPORTED SYSTEMS

Supported systems are the key decision support systems the operational commander will use to assess the logistics situation and make decisions to achieve mission objectives.

GCCS Common Operational Picture – Combat Support Enabled (COP-CSE)

The COP-CSE resides on the Global Command and Control System COP and is a Unix-based client application to the Combat Support Data Environment (CSDE). It provides the capability for the user to query logistical information on tracks located on the GCCS COP and adds the capability to display and query sites and operations on the GCCS COP. The COP-CSE provides a map-based situational awareness picture of the battle space. This allows the visualization of information across combat support functions, and between combat support and command and control (GCCS) functions in support of the Joint War fighter.

Transportation Coordinator – Automated Information for movement system (TC-AIMS)

The goal of TC-AIMS II is to provide an integrated information transportation system capability for routine deployment, sustainment, and redeployment/retrograde operations by employing the same DoD and Service shipment policies and procedures in peace and war for both active and reserve forces. TC-AIMS II must be capable of supporting routine and surge requirements, and must automate origin shipping/receiving and deployment: sustainment and redeployment/retrograde processes; produce movement documentation, unit move data; and furnish timely information to major commands (MAJCOMs/MACOMS), transportation component commands, United States Transportation Command (USTRANSCOM), and the Joint deployment community. As a DoD source movement information system, TC-AIMS II must provide data for In-Transit Visibility (ITV), and control over cargo and passenger movement.

For the Navy, a key capability of this system is to provide a direct feed into the Advanced Traceability and Control (ATAC) System. The ATAC system ensures that end units are not charged Depot Level Repairable Carcass charges. With this capability, it will reduce the need for at least two Navy unique systems, and also simplify supply procedures for naval units.

FUTURE SYSTEMS

The Services should continue efforts to attack the logistics information infrastructure by reducing the number of information systems required to support military operations. At the

same time, new network centric capabilities are emerging which need to be exploited. Two of the most exciting capabilities include collaborative and reach back systems.

Collaborative systems include video-teleconferencing, real time keyboard chat sessions, and voice sessions over the same line. These capabilities need to be integrated with the Common Operating Picture, so that widely dispersed personnel can communicate within a common frame of reference.

Reach back systems offer the capability to tap into subject matter expertise at shore activities, in the face of equipment malfunctions or systems analysis. The Navy has implemented the Maritime Logistics Data Network as an example of this capability. This replicates real time activity in the supply database of the USS Harry S. Truman while it is underway. It also offers authenticated shore users to use a Virtual Private Network to log on to the Truman's system while it is underway. Reach back systems offer the opportunity to reduce the administrative workload of forward deployed units.

LOGISTICS ORGANIZATION IN THE INFORMATION AGE

In the book, Network Centric Warfare, the authors explain how commercial organizations are exploiting today's information environment. The power of a new technology cannot be exploited without the co-evolution of organization and process. It then begins to show some applications for which network centric organizations can rely upon. The authors make a point to show that the similarities are very hypothetical. It also mentions that the DOD makes up less than 10% of the information systems market, so that the other 90% of this market can have valuable insights. The book shows many examples of how modern organizations are leveraging information to improve their bottom line, which provide interesting insights. For example, they often cite using information instead of inventory to solve a problem, the benefits of outsourcing, and the ability to work non-stop across time zones.

A model that warrants increased attention is the Sense and Respond Model. This is the next generation from the 'make and sell' model. Today we know much less about our enemy than we have in the past. The Sense and Respond Model offers a better vantage point to address this sort of threat. Sense, in the form Sensors and the multiplicative effects of fusing the sensors together, is another theoretical underpinning of Network Centric Warfare.

When considering the Sense and Respond Model, and JV2020 Focused Logistics, the use of Supply Chain Management techniques should be considered. Supply Chain Management emerged from the concept of avoiding the Whipsaw Effect. If you've ever run through a field with your hands interlocked with another 10 people, and the first person stops

while everyone keeps their hands interlocked, the last person usually gets thrown to the ground or breaks the chain, creating the Whipsaw Effect. Supply Chains can also suffer from the Whipsaw Effect. The Whipsaw Effect can be eliminated by sensing...understanding and seeing the demands of your supplier, while also seeing the demands of your customer. The result is a controlled and calibrated flow of material into and out of a theater.

THEATER LOGISTICS COMMAND AND CONTROL

Several factors are fostering change to current logistics operational doctrine. The large, cumbersome forces of the Cold War are being replaced with smaller, flatter, more agile, and more lethal forces that require a modern logistics infrastructure that can provide efficient and effective support. The current and foreseeable future resource environment will continue to be constrained, with all of our forces being required to do more with less. At the same time, technological advances of the Information Age are providing excellent opportunities for increasing productivity and efficiency.

Previous efforts to apply a 'joint flavor' to logistics include the concepts of Joint Theater Logistics Management and the Army's Theater Support Command (TSC), which has been developed by the Combined Arms Support Command (CASCOM) at Fort Lee, Virginia. The TSC is an Army-specific organization that is responsible for providing common-user logistics support to Army, joint, combined, and allied forces in the theater of operations. It is structured to incorporate available host nation support assets. This organization reports to the Army service component commander, and focuses on eliminating logistics fragmentation within the Army service component. Still there exists a persistent problem with support to the other Service's logistics needs.

Efforts to have the Army support Navy units in the past have missed specific details. In one case, Army logisticians procured bottled water to support maritime forces but did not procure the necessary lift pallets or material handling equipment to efficiently get the bottled water on board, wasting valuable time and sailor morale. This one isolated example shows how well meaning, dedicated logisticians may not be able to provide unique, cross service logistics support without a Service representative that understands Service requirements.

LOGISTICS IN PEACE...LOGISTICS IN WAR

All current U.S. military logistics doctrine is based on Title 10 of the United States Code, which requires each Service component to train and supply its own forces. Operational commanders depend on various Service components to provide the quantity and types of forces needed to accomplish the assigned mission. Compounding this problem in the operational

theater is the fact that each Service, as well as each allied and coalition member, establishes individual logistics organizations to provide support to its own forces. Joint Pub 0-2, Unified Action Armed Forces, published in 1995, indicates that the Services have responsibility for logistics support of their own units, yet it also states that the Combatant Commander have approval authority over Service logistics programs.

Joint Pub 0-2 states that the Joint Force Commander has different authority for logistics, based on whether the unit is operating in peacetime or wartime conditions. In peacetime, the Joint Force Commander has logistics authority 'consistent with peacetime limitations'. Yet in a war or crisis, the JFC may 'use all facilities and supplies of all forces assigned to their commands as necessary for the accomplishment of their mission'. This conditional approach to logistics presents the Joint Force Commander with a unique set of responsibilities, but only in crisis situations.

UNITY OF EFFORT

Unity of effort, achieved through and with unity of command, can improve the efficiency and effectiveness of logistics operations. An operational logistics structure that fails to achieve unity of command and maintains stovepipe organizations will detract from any unity of effort. Under current doctrine, the multiple logistics organizations that reside in a theater of operations do not allow for prudent management and control of limited resources. Historically, a Service-specific logistician strives to maximize support to his assigned customer while, in many cases, competing with another organization for the same resources. This factor is especially crucial when addressing the limited availability of transportation assets for force deployment.

Many would argue that competition among the Services is simply a reflection of an integral, healthy part of American society. Although competition is healthy at certain times, and in certain places, it is not healthy as a part of the command and control structure in an inherently joint or allied/coalition theater of operations. At such times, there may already exist high levels of confusion and stress. During conflict, the military must forego inter-service rivalries so it can function as a joint team that is capable of conducting combined operations. Supporting agencies both within and outside of the military, such as the Military Sealift Command, the Military Traffic Management Command, the Defense Logistics Agency, civilian contractors, and numerous other critical agencies, must be fully integrated to maximize support to the mission.

The Joint Staff J4 have established six tenets to Focused Logistics. These include Joint Deployment/Rapid Distribution, Information Fusion, Health Protection, Multinational Logistics,

Agile Infrastructure, and Joint Theater Logistics Management. The Joint Theater Logistics Management (JTLM) tenet provides the focus and impetus for revised theater logistics doctrine.

Dependent upon the size and complexity of an operation, there may be literally dozens of logistics nodes serving the theater, each reporting to multiple organizations or chains of command. Under the JTLM concept, as joint force operations commence, theater distribution and allocation decisions will be handled by an in-theater joint logistics organization comprised of a multi-Service group of senior logistics advisors to the Joint Force Commander (JFC).

THE JOINT FORCE LOGISTICS COMPONENT COMMANDER (JFLOG)

With efficiency and effectiveness as a driving force in Focused Logistics, and the stated importance of JTLM as a critical tenet, the time is right to change joint doctrine to create a Joint Force Logistics Component Commander (JFLOG). The JFLOG will be a truly joint force, with representative from each service, as well as the Defense Logistics Agency as members. This organization could be expanded by augmentation of battle-rostered reserves from the Services.

For the Navy, a major concern with this structure is that the unit's logistics support must operate in peace the same way it operates in war. The Navy's continuous presence in foreign and distant waters requires continuous logistics support presence to sustain it. In many cases, Navy units may deploy to an area that does not require JFLOG instantiation. In this case, the Navy must continue to use the CINCs permanent service component commander infrastructure to support it. However, when there is a deployment of joint forces to a region, the Navy must use the same logistics pipeline and contracting organization. Other services will be able to benefit from negotiated agreements already established with naval units, to facilitate the effective movement of forces into a theater. All services will additionally benefit from the economies of scale for common user logistics items.

We need to fight and train in peace the same way we fight in war. The conditional responsibility prescribed in Joint Pub 0-2 and 4-0 is wrong and needs to be modified so that a Joint Force Logistics Component Commander may be established to optimize logistics support for joint and multinational operations at all times.

The theater logistics structure must include the capability to redirect or cross-level critical items of supply from one organization to another. For maximum efficiency, the senior operational level logistics commander must have total asset visibility and control of all available resources and supplies. E existing and proposed logistics systems do not provide a logistics commander with total asset visibility, or with the authority he needs to accomplish this cross-leveling task.

This organization would report directly to the Joint Force Commander. The structure would be modular, and would permit operations at any level of conflict through centralized planning and decentralized execution. Modularity also would enable split-based operations, as well as the incorporation of reserve component follow-on forces in a streamlined, tailored organization.

There are several disadvantages that must be addressed when revising operational logistics doctrine for logistics support structure and systems. A theater-level logistics support structure can evolve into a rather large, although modular, organization, thereby creating problems, such as a large battlefield signature and difficulties in command and control. It also may not be possible to establish a single combined command with foreign allied or coalition forces in a multinational force environment for political, economic, or military reasons. The individual Service components also may feel threatened in the current environment of constrained resources and force reductions. However, all of these challenges can be overcome by a truly joint and combined vision at all levels of our military command structure.

We no longer can afford a fragmented and compartmentalized logistics support structure that duplicates effort and generates waste. Lessons from our most recent conflicts and the benefits of information technology demand that we change old organizational structures. In meeting this demand, an effective JFLOG will provide a versatile and flexible organizational command and control structure that gives our tailored operational support forces the capability to execute any mission with outstanding results.

CONCEPT TO PRACTICE

One of the basic issues toward achieving Network Centric Logistics is the language in which today's weapons communicate, and the language in which the 'info structure' communicates. NCW systems need to conform to a new Internet protocol standard, which will allow both tactical and operational information exchange on the same pipe.

JOINT THEATER LOGISTICS ADVANCED CONCEPTS TECHNOLOGY DEMONSTRATIONS

The recently created United States Joint Forces Command (USJFCOM) was officially established on October 7, 1999. USJFCOM was re-designated from the former United States Atlantic Command. JFCOM's new role is to lead the transformation of the United States armed forces and to meet the security challenges of the 21st century. Joint Forces Command is the primary catalyst for joint force integration, training, experimentation, doctrine development and testing. JFCOM sponsors Advanced Concept Technology Demonstrations in order to promote

the concepts of JV2020, and has a specific focus for a series of Joint Logistics Advanced Concept Technology Demonstrations (JL ACTD).

The principal goal of the JL ACTD is to revolutionize the logistics planning and execution process by providing specific domain capabilities and the rapid application of emerging information technologies. It delivers tools to all users via a web-based client/server environment that complies with Defense Information Infrastructure (DII) Common Operating Environment (COE) standards. All the tools use a common visualization component to view maps, charts, tables, and graphs. Data mediation technology is being utilized to source data from multiple classified DOD databases. The mediation approach, employing a data mart, provides a near-instantaneous query response capability that incorporates joins and unions of data from disparate sources.[6]

MEASURES OF SUCCESS

Measures are a key indicator of any project. All participants must know the goal, and must know if we are making progress toward the goal, and must become inherent stakeholders toward achieving the goal.

In simple terms, measures can be divided into efficiency measures and effectiveness measures. Efficiency measures might include cost of operating the information infrastructure before and after the pilot. Effectiveness measures define whether levels of service are improved with this new system. Sample measures may include customer wait time, repair turnaround time, gross and net effectiveness.

The key behind all measures is to understand the intent of the people that are collecting them. The most challenging part of any project it realizing that when you ask a functional expert to provide measures or make recommendations on improving processes, the functional expert is potentially putting himself or a co-worker out of a job. If we can truthfully address these issues up front, success will come to the project.

CONCLUSION

The concept of Network Centric Logistics offers a tantalizing promise in today's Information Age. However, we must keep in mind the verities of war. Although Network centric logistics may ameliorate yesterday's fog of war, it must also address tomorrow's new and different fog, a fog represented by information overload and dependence on electronics. Systems which leverage Network Centric Logistics must have the knowledge of past experience built in, and the capability to change rapidly as functional processes change.

Word Count: 5,992

ENDNOTES

[1] David Schrady, "Combatant Logistics Command and Control for the Joint Force Commander," Summer, 1999; available from <http://www.nwc.navy.mil/press/Review/1999/summer/art2-su9.htm>; Internet; accessed 10 February 2001.

[2] Paul Straussman, The Politics of Information Management. New Canaan, Connecticut: The Information Economics Press, 1995: 164.

[3] James Johnson, "About the Defense Logistics Management Standards Office," 6 February 01; available from <http://www.dla.mil/j-6/dlmso/About/Default.htm>; Internet; accessed 10 February 2001.

[4] Ibid.

[5] Bill Murray, "Joint Chiefs Make Web Technology a logistics focus," 11 September 2000; available from <http://www.gcn.com/vol19_no27/dod/2869-1.html>; Internet; accessed 10 February 2001.

[6] Lou Mason, "The Joint Logistics Advanced Concept Technology Demonstration," 30 May 2000; available from < http://oak.man.external.lmco.com/public/default.htm>; Internet; accessed 1 February 2001.

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